भारतीय मानक

Indian Standard

IS 5549 : 2023

वारफ़रीन बैट कॉन्सेंटरेट्स — विशिष्टि

(पहला पुनरीक्षण)

Warfarin Bait Concentrates — Specification

(First Revision)

ICS 65.100.99

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Pesticides Sectional Committee, FAD 01

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Pesticides Sectional Committee had been approved by the Food and Agriculture Divisional Council.

Warfarin bait concentrates are used in formulating rodent baits for the control of rodent pests in homes, fields and warehouses.

The standard was first published in 1970. In this revision, the standard has been brought out in the latest style and format of the Indian Standards, and references to Indian Standards wherever applicable have been updated. It also incorporates two amendments issued to this standard.

In the preparation of this standard due consideration has been given to the provisions of the *Insecticides Act*, 1968 and the rules framed thereunder. However, this standard is subject to the restrictions imposed under these, wherever applicable.

For the purpose of deciding whether a particular requirement of this standard is complied with,the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

WARFARIN BAIT CONCENTRATES — SPECIFICATION

(First Revision)

1 SCOPE

This standard prescribes the requirements and the methods of test for warfarin bait concentrates used in the preparation of rodent baits.

2 REFERENCES

The standards given below contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of these standards:

IS No.	*Title*
IS 460 (Part 1) : 2020	Test sieves — Specification: Part 1 Wire cloth test sieves (*fourth revision*)
IS 1070 : 2023	Reagent grade water — Specification (*fourth revision*)
IS 5552 : 2022	Warfarin, technical — Specification (*first revision*)
IS 8190 (Part 1) : 1988	Requirements for packaging of pesticides: Part 1 Solid pesticides (*second revision*)
IS 10627 : 1983	Methods for sampling of pesticidal formulations

3 REQUIREMENTS

3.1 Physical

The material shall conform to the following physical requirements.

3.1.1 *Description*

The material shall consist of technical warfarin compounded with talc or other suitable diluent, and shall be in the form of uniformly blended free-flowing powder, free from lumps and extraneous impurities which may limit its suitability for baiting rodents or impair its effectiveness. The technical warfarin used in the manufacture of the concentrates shall conform to IS 5552.

3.1.2 *Sieving Requirement*

When tested by the method prescribed in Annex A, not less than 95 percent by dry weight of the initial amount taken for the test, shall pass through 75 micron IS Sieve [*see* IS 460 (Part 1)].

3.2 Chemical

The material shall comply with the following chemical requirement.

3.2.1 *Warfarin Content*

When determined by the method prescribed in Annex B, the observed warfarin content, percent by mass, of any of the samples shall not differ from the nominal value by more than the tolerance limits indicated below:

Sl No. (1)	*Nominal Value, Percent* (2)	*Tolerance Limit, Percent* (3)	
i)	Up to 9	+ 10 - 5	of the nominal value
ii)	Above 9 and below 50	± 5	
iii)	50 and above	+ 5 - 3	

The actual value of the technical material in the formulation shall be calculated to the second decimal place and then rounded off to the first decimal place before applying the tolerances given above.

4 PACKING

The material shall be packed shall be packed according to the requirements given in IS 8190 (Part 1).

5 MARKING

5.1 The containers shall be securely closed and shall bear legibly and indelibly the following information:

a) Name of the material;
b) Name and address of the manufacturer;
c) Batch number;
d) Date of manufacture;
e) Date of expiry;
f) Net quantity;
g) Nominal warfarin content, percent (*m*/*m*);
h) Cautionary notice as worded in the *Insecticides Act*, 1968, and rules framed thereunder; and
j) Any other information required under the *Legal Metrology* (*Packaged Commodities*) *Rules*, 2011.

5.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

6 SAMPLING

When freshly manufactured material in bulk quantity is offered for inspection, representative samples of the material shall be drawn and tested as prescribed in IS 10627 within 90 days of its manufacture. When the material is offered for inspection after 90 days of its manufacture, sampling shall be done as prescribed in IS 10627. However, the criteria for conformity of the material when tested, shall be the limits of tolerances, as applicable over the declared nominal value and given under **3.2.1** of the standard.

7 TESTS

Tests shall be carried out by the appropriate methods referred to in **3.1.2** and **3.2.1**.

7.1 Quality of Reagents

Unless specified otherwise, pure chemicals and distilled water (*see* IS 1070) shall be employed in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

ANNEX A

(*Clause* 3.1.2)

TEST FOR SIEVING REQUIREMENT

A-1 APPARATUS

A-1.2 Test Sieve — 75 micron IS Sieve [*see* IS 460 (Part 1)], prepared for test by removing any film, grease or other water-repellent material and then drying.

A-2 METHOD

Weigh accurately 100 g of the material and transfer it to the test sieve. Cover the sieve and screen the material in a suitable sieve vibrator for 10 minutes. Two small square rubber cubes are introduced along with the material on the sieve to facilitate the breaking up of any soft lumps of the caked material. After 10 minutes, stop the machine and brush the residue on the sieve into a tared weighing dish. Weigh the dish and determine the weight of the residue.

A-3 CALCULATION

Material passing through 53 micron IS Sieve, percent by mass =

$$\frac{100\,(W - w)}{W}$$

where

W = mass, in g, of the material taken for the test; and

w = mass, in g, of the material retained on the test sieve.

ANNEX B

(*Clause* 3.2.1)

DETERMINATION OF ACTIVE INGREDIENT CONTENT

B-1 APPARATUS

B-1.1 Spectrophotometer — Beckman, model DU, or equivalent instruments with l cm quartz cells.

B-2 REAGENTS

B-2.1 Reference Solution

Prepare by pipetting 2 ml of ethylene dichloride into a glass stoppered cylinder, adding 10 ml of 1 percent sodium hydroxide solution with a pipette, and shaking for one minute. The sodium hydroxide layer is decanted into a centrifuge tube and centrifuging until it becomes clear.

B-3 PROCDURE

Weigh accurately about 600 mg of the sample into a 125 ml glass stoppered flask, add 50 ml of ethylene dichloride with a pipette, place the flask on a shaking machine and shake forat least 10 minutes. Transfer the contents to a centrifuge tube, stopper and centrifuge at high speed for 5 minutes or until clear. Pipette 2 ml of ethylene dichloride extract into a glass stoppered cylinder, add 10 ml of one percent sodium hydroxide solution with a pipette, and shake by hand for 1 minute. Decant the sodium hydroxide layer into a centrifuge tube and centrifuge until clear. Pipette a sufficient amount (about 3 ml) of the alkali layer into 1 cm quartz cell and, with the spectrophotometer set at maximum sensitivity determine its absorption (*see* Note) at 308 nm against the reference solution.

NOTE — For routine testing it is necessary to have a standard curve down and compared with thetest sample.

B-4 CALCULATION

B-4.1 Molecular mass of warfarin = 308.3

molar extinction coefficient = 1.42×10^4

[Molar extinction coefficient shall be determined with pure 3-(alpha-phenyl-beta-acetylethyl)-4 hydroxycoumarin; the value given here is an example only.]

3-(alpha-phenyl-beta-acetylethyl)-4 hydroxycoumarin, percent content (warfarin) =

$$\frac{E \times 308.3 \times 10 \times 50 \times 100}{1.42 \times 10\,000 \times 1\,000 \times 2 \times W} = \frac{E \times 0.54}{W}$$

where

E = absorption of the final solution at 308 nm; and

W = mass, in g, of the sample.

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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